

THIS PAPER IS NOT TO BE REMOVED FROM THE EXAMINATION HALLS

UNIVERSITY OF LONDON

291 0314 ZB

BSc Examination
for External Students

**COMPUTING AND INFORMATION SYSTEMS AND
CREATIVE COMPUTING**

Software Engineering Management

Dateline: Thursday 14 May 2009 : 10.00 – 12.15 pm

Duration: 2 hours 15 minutes

There are FIVE questions on this paper. Candidates should attempt no more than **THREE** questions. All questions carry equal marks and full marks can be obtained for complete answers to **THREE** questions. Questions involving a description of explanation should, wherever possible, be accompanied by an appropriate example.

A hand held calculator may be used when answering questions on this paper but it must not be pre-programmed or able to display graphics, texts or algebraic equations. The make and type of machine must be stated clearly on the front cover of the answer book.

**NOTE: AN INITIAL STATEMENT OF REQUIRMENTS FOR A
HYPOTHETICAL SYSTEM 'BOAT' IS USED IN ALL OF THE
QUESTIONS IN THIS PAPER. THIS STATEMENT OF REQUIRMENTS
IS APPENDED TO THIS PAPER. READ IT BEFORE ATTEMPTING TO
ANSWER ANY OF THE QUESTIONS.**

- Q1.** Study the initial requirements for **BOAT** appended to this examination paper and then answer **all** parts of this question.
- (i) Using the case shown in the Appendix, identify types of Information Technology (IT) that might be deployed by a cruise travel company, and describe in what way the concept of Information Systems (IS) is broader than that of IT. [10]
 - (ii) As a software engineer developing the BOAT Information System, what characteristics would you expect of such an implementation? [5]
 - (iii) What costs may be incurred in both the development and operation of the system from a risk management perspective? Give examples to illustrate your answer. [10]
- Q2.** Study the initial requirements for **BOAT** appended to this examination paper and then answer **all** parts of this question.
- (i) Give suggestions for adopting a cost estimation model by comparing and contrasting traditional cost estimation techniques (such as 'Price-to-win' or COCOMO for example). [12]
 - (ii) Since the BOAT project will rely on information that is integrated between separate databases, describe the most effective approach to data and information management. [13]
- Q3.** Study the initial requirements for **BOAT** appended to this examination paper and then answer **all** parts of this question.
- (i) Identify quality tools and techniques that can be used during (or after) the implementation of the on-line booking system. Give examples. [5]
 - (ii) *"Fagan inspections are a useful means to ensure quality is achieved within the software product and software process lifecycle".*
Describe and then justify the set of procedures adopted by such an inspection team in the context of this statement. [8]
 - (iii) Describe Software Quality Assurance (SQA), Total Quality Management (TQM) and the Capability Maturity Model (CMM). Why are these concepts vital for the successful implementation of the proposed system? [7]
 - (iv) As a project manager working on the BOAT system, what two main types of software quality metrics might you use? Give examples of both types of metrics. [5]

- Q4.** Study the initial requirements for **BOAT** appended to this examination paper and then answer **all** parts of this question.

As a natural extension of the BOAT information system, the company is considering the development of an 'on-line' cultural facilities module within the booking system, CABINS. The new module would allow booking of on-board talks or short courses optionally linked with tours of corresponding historical sites near ports of call on the cruise.

- (i) Define the broad concept of Information Systems Stakeholders. [3]
- (ii) Identify the stakeholders involved in the proposed module. Using appropriate software engineering techniques, such as Data Flows and Entity Relationship Diagrams, present the structure of the required supply chains. [10]
- (iii) Identify risks to which the BOAT system is exposed (i.e. risks that might affect the operation of the system once rolled out) and in each case:
 - state the causes and consequences of the risk;
 - assess its magnitude and likelihood; and
 - describe the steps you would take to reduce the magnitude of the risk.

[12]

- Q5.** Study the initial requirements for **BOAT** appended to this examination paper and then answer **all** parts of this question.

- (i) Describe the main functions of SMOG, CABINS and DEBT, and identify the items of data that each is likely to handle. [9]
- (ii) Taking account of the number and complexity of the functions and data items, estimate the amount of effort required in each phase of development of the SMOG and CABINS software, in person-months. In so doing, derive a rough initial estimate of the total effort to develop the complete software for BOAT. Briefly explain your reasoning. [11]
- (iii) As a project manager, how would you monitor the development of SMOG to maximise the likelihood that it was completed by the required deadline? What would you do if a slippage appeared likely? [5]

APPENDIX

THE FOLLOWING INITIAL STATEMENT OF REQUIREMENTS FOR A HYPOTHETICAL SYSTEM IS USED IN ALL QUESTIONS IN THIS PAPER.

SailAway Pte is a rapidly growing cruise ship travel company that has become a market leader in regional and world holiday tour provision. Because of their success, SailAway wish to implement an on-line ticketing and seat reservation system, accessible via the World Wide Web. This is to attract private and corporate internet-enabled customers as part of a strategic plan of the organisation.

The company has recently put out a request for expressions of interest prior to a call for tenders and, as head of a small software engineering company (with a staff of eighteen) that has expressed interest in the work, the following systems requirements have been faxed to your office.

Booking Online Aquatic Travel (BOAT)

SailAway Pte wish to give their customers the facility to book their travel via the World Wide Web using an Internet browser (e.g. Microsoft Explorer or Netscape Communicator). SailAway Pte operates a fleet of ships with a varied annual timetable for its cruises. It is important that a customer is notified of cabin availability or unavailability on any scheduled cruise that fits their requested dates and destinations, while on-line and with an acceptably short response time. To satisfy this requirement, BOAT requires the integration of two other systems. One is the Ship Maintenance Operations Guide (SMOG) database that holds information on the operational status of each ship. The second is the Customer Accommodation Booking Inquiry Networked System (CABINS) that is the database used in ticketing and cabin reservations. Both are located centrally at the head office in Dubai, UAE.

The customer user should be able, on one page or form, to specify their cruise requirements including dates, destinations, preferred departure port and cabin requirements (including group numbers, numbers per cabin, and class of accommodation). This information is then used to check cruise and cabin availability on the CABINS database and to verify ship data from the SMOG database.

Once a user has submitted their travel requirements, BOAT should respond by presenting information including the availability or unavailability on the dates of the required class of ticketed accommodation, departure port, and destination port. Payments by credit card or other electronic means for cabin bookings, using the Debits by Electronic Banking Transfer (DEBT) system, are to be incorporated into the design of this internet-based booking and ticketing system. DEBT is an existing package that SailAway Pte commissioned before the start of the BOAT project.

At intervals BOAT will provide a detailed report of customer profiles, of how many users have accessed the website, and what travel requirements they have selected (including cabin class of travel and connecting travel (e.g. airflights) information).

SailAway Pte require that the system must be operational within 12 months and should be revenue-producing within 18 months of the tender to contract.

End of Statement of Requirements for BOAT

END OF EXAMINATION